



Ten digital trends shaping the future of retail

Asia Distribution and Retail

As the digital transformation of retail accelerates around the world, the expectations of consumers at each stage of the customer journey – be it pre-purchase research or browsing, the shopping experience itself or post-purchase experience sharing – are changing. The adoption of breakthrough technologies such as artificial intelligence (AI), the Internet of Things (IoT) and blockchain can help brands and retailers address these changing consumer expectations in a timely and effective manner, thereby deepening their engagement with customers.

In an increasingly competitive environment, digital transformation is, indeed, fast becoming a matter of survival for retailers and brands which, in turn, are increasingly willing to invest more in cutting-edge technologies. According to Gartner, the global spending on technology in the retail sector is estimated to grow by 3.6% year-on-year (yoy) to reach US\$203.6 billion in 2019, and this growth is expected to continue over the next two years¹.

In this report, Fung Business Intelligence identifies the top 10 retail technology trends shaping the future of retail, globally, in 2019 and beyond.



1

AI: retail's big game changer

Traditional retailers and e-commerce operators alike are now deploying AI across the whole supply chain from

product development and merchandising to marketing, to customer engagement, in the hope of improving operational efficiencies, reducing costs and enhancing shopping experiences. Customer interaction via AI is retail's new frontline. Gartner projects that 85% of customer interactions in the retail sector will be managed by AI by 2020².

Amazon and Alibaba are among the earliest to have leveraged big data and AI algorithms to transform retail. Amazon, for example, has used AI since the Internet giant's earliest days to come up with product recommendations. Thanks to advances with machine learning, Amazon's personalized recommendations are increasingly accurate in hitting their target. The use of AI and machine learning also enabled Amazon to launch its Alexa voice assistant; to offer cloud-based services to users of Amazon Web Services (AWS), and to allow shoppers to take products and exit Amazon Go grocery stores without passing a checkout.

For its part, China-based Alibaba is using AI and other advanced technologies to bridge bricks-and-mortar retail

with e-commerce and to improve the overall retail experience for consumers. Alibaba calls this its "New Retail" strategy. Its fresh food-focused supermarket Hema Xiansheng has become one of Alibaba's best domestic testing grounds for this New Retail strategy. Customers can shop in-store or via Hema Xiansheng's app, scan QR codes to see the origins of products, have food delivered for free or ready for pickup within 30 minutes, and to pay using facial recognition technology.

U.S. retail chain Walmart hopes to improve its customers' experience with "Scan and Go Shopping". Customers in pharmacy and checkout areas can use the Walmart app to settle payment, bypassing the traditional checkout process. Walmart also uses facial recognition technology to identify unhappy or frustrated shoppers, enabling it to assign more sales associates to help, as needed. In China, Japanese clothing chain Uniqlo has launched an AI shopping guide, Xiaoyou, on its official WeChat account. Users can interact with Xiaoyou by scanning QR codes printed on product tags, or through voice search and text search.

In the new digital era for retail, AI is fundamental to success. To stay competitive and relevant, more retail companies and brands are likely to deploy it in their digital transformation journey.



2

IoT: tightening the retailer-customer connection

The Internet of Things (IoT), a network of billions of physical devices connected to the Internet, enables them to communicate, collect and share data. It thus allows for virtually endless connections to take place. As the IoT becomes more sophisticated, it is turning into an integral part of retail operations. According to U.K.-based Juniper Research, retail spending on IoT technologies is estimated to reach US\$670 million in 2018 and is expected to increase fourfold to US\$2.5 billion by 2020⁹.

Radio-frequency identification (RFID) is among the first retail applications of the IoT. The use of RFID tags – a type of tracking system that uses smart barcodes to track and identify items – allows retailers to take end-to-end control of inventory, tracking goods at each step through the purchasing process. For instance, Canadian athletic apparel retailer Lululemon uses RFID tags to update and check inventory levels across its stores worldwide. As a result, its inventory accuracy reportedly improved to 98%. Another example is iconic U.S. clothing company Levi's. It has introduced shelf-level sensors in its stores which use RFID tags to detect products. Sales associates can use wireless tablets to assist customers on the spot, and check inventory for size, color and price. This has not only improved customer service but also resulted in a 10% reduction in inventory cost through better knowledge of product whereabouts.

“Beacons” are another common IoT application. These devices use low-energy Bluetooth connections to give shoppers valuable information about sales and other promotions accessible in nearby stores. This location-based information is displayed on shoppers' smartphones. With beacon technology, brands and retailers can more easily reach their target audiences and provide an engaging experience.

The IoT is also being used increasingly to track product deliveries. With omnichannel retailing gaining momentum, the ability to track orders and deliveries accurately is more important than ever. More and more retailers have introduced “Click and Collect” services which allow online customers to pick up their purchases at conveniently-located physical stores. This requires more precise inventory tracking. With IoT technology, all products can be better monitored and more intelligently tracked when in transit.

As the IoT becomes more prevalent and mature, retail companies are ramping up its deployment and incorporating the technology into their business operations. In particular, some companies are trying to integrate machine learning, into their IoT applications. Moving forward, we expect still more revolutionary ideas to come with the Artificial Intelligence of Things (AIoT) – the next generation of IoT – which greatly facilitates the exploration of new business innovations such as unmanned stores and autonomous warehouses/vehicles.

3

Greater operational efficiencies with “the cloud”

Cloud computing is a network of remote servers hosted on the Internet to manage, store and process data both for companies and individuals. By using cloud-based services offered by reputable and trustworthy third parties, companies can free themselves from the need to operate and maintain their own computing infrastructure. This significantly reduces costs and allows them more flexibility.

In the retail sector, cloud computing is particularly efficient in the collection and analysis of huge volumes of sales data and in real-time inventory management. With cloud computing, retailers have enterprise-wide supply chain visibility and real-time access to all operational and transactional data across their businesses. Cloud computing also enables companies to enhance channel operations by tracking customer preferences. This makes for more accurate trend forecasts, and better merchandising decisions. It also enables retailers to personalize their offers and services for customers.

It is little wonder, then, that many retailers are accelerating their adoption of cloud-based technologies. For example, Italian manufacturer, papermaker and product designer Moleskine worked with Oracle Commerce Cloud, part of the Oracle Customer Experience (CX) Cloud Suite, in 35 countries to carry out integrated online campaigns across the globe in the hope of delivering consistent customer experiences. U.S. pharmacy Walgreens is using IBM's Cloud and retail analytic tools across all of its locations to identify where and when service calls are most frequent, enabling it to consolidate these while also handling individual customer needs more effectively. This frees up resources for other uses.

Looking ahead, more retail enterprises are set to transform their operations by using cloud-based technologies. According to MarketsandMarkets, a market research and consulting firm based in India, the retail cloud market is expected to grow at a CAGR of 20.9% to US\$28.53 billion by 2021⁴. Cloud computing will continue to enable new service solutions, help deliver analytics and insights, and give rise to new functionalities.



4

Technological innovations are reshaping the future of smart stores



A successful bricks-and-mortar store is no longer a place solely for shopping; it is also a place of entertainment and of technology-enabled elements that facilitate online-to-offline (O2O) integration. As a result, the rise of smart stores – a recent global phenomenon – is set to continue into the coming year.

An increasing number of companies in diverse retail segments are upgrading their physical stores into smart stores. Prominent examples in the grocery sector include Amazon's Amazon Go and Alibaba's Hema Xiansheng. In different ways, both companies are using latest technology innovations to pioneer cashierless stores. Amazon Go

advocates "Just Walk Out Shopping". After shoppers check in by scanning their unique QR code, overhead cameras together with weight sensors in the shelves precisely track which items they pick up and take with them. When they leave, Amazon Go's systems automatically debit their accounts, sending their receipt to the app. Hema Xiansheng offers customers the ability to shop in-store or on its app. It uses big data on customers to optimize the stores' offerings. Each Hema Xiansheng store even doubles as a distribution center. Customers within a 3km radius can receive their groceries within 30 minutes. Carrefour followed suit in May 2018 by opening its first smart supermarket in China, Le Marché. The store features "Scan and Go" payment service, facial recognition payment and electronic labeling systems. JD.com joined the smart race by launching its JD convenient store in June 2017 and smart supermarket 7Fresh in January 2018, utilizing big data to analyze what products to promote, and when and what to restock on shelves.

Other retail segments are also seeing the emergence of smart stores. In July 2018, Nike rolled out "Nike Live" in Los Angeles. It is a concept store leveraging digital data from its user community to tailor in-store omnichannel experiences, including try-ons, order pick-ups, and to determine which products to display. Also in July, Alibaba debuted a "FashionAI" pop-up store in China with apparel retailer Guess, using smart mirror technology, RFID, machine learning, and computer vision to bring mix-and-match styling to customers in-store. South Korean cosmetics brand Innisfree also opened a smart store in Hangzhou, incorporating tech features such as smart mirror for virtual makeup experimentation; a skin analyzer that can generate a report on a customer's skin condition, along with recommended products, and a "cloud shelf" that allows customers to see all products available from Innisfree's Tmall flagship store, and more.

The use of such technologies in-store and the ongoing rise of smart stores remains a trend to watch in 2019. We expect more brands and retailers to introduce technology-enabled experiential elements in-store, while seamlessly bringing offline and online experiences together, in order to attract higher footfalls and offer better shopping experiences.



5

AR and VR technologies take off

The use of immersive technologies, particularly augmented reality (AR) and virtual reality (VR), is about to become

the norm for omnichannel retailing and brand experiences. Immersive technologies blur the line between bricks-and-mortar and digital, creating a virtual environment in which customers can immerse themselves and experience “real world” emotions. Thanks to the rapid uptake of AR and VR technologies in retail and other industries, the global market size of AR and VR is estimated in dollar terms to soar from US\$6.1 billion in 2016, to US\$14.1 billion in 2017, and to US\$209.2 billion in 2022⁵.

Increasingly, brands and retailers are using AR and VR technologies to deepen the online and offline experiences of customers; to offer interactive product demonstrations and product customization, and to help customers visualize how different products might look in different settings. Ikea is among the forerunners. In 2013, even before Pokémon Go elicited mass global interest in AR, IKEA released an AR catalogue app that let customers see how various furniture items would look in their own homes. Similarly, in 2017, Ikea created an AR app called “Ikea’s Place” which allows shoppers to access 3,200 items from Ikea’s inventory via a live view function on their smart phone that also lets them see how specific items would look in their home. U.S. department store chain Macy’s has launched VR furniture shopping experiences in about 70 of its stores nationwide, with plans to expand these capabilities to 20 more stores by January 2019. Shoppers can design a living space with 3D furniture images and use VR headsets to “move” through the space to see if they like an item before making

purchase. It is reported that Macy’s furniture sales involving VR have increased by more than 60%. Additionally, Macy’s has launched an AR-enabled tool, “Visualize Your Space”, on its app. It allows users to place Macy’s furniture virtually into photos of their home, testing how the furniture might fit there.

Beauty retailers such as Sephora, L’Oréal and Charlotte Tilbury have launched AR mirrors that enable customers to try on cosmetics products virtually. In the fast fashion segment, Zara rolled out an AR app in the U.S. for two weeks in April 2018, allowing customers to point smart phones at store windows or in-store sensors and see models come to life on their screens – walking and even talking – wearing selected items from the Zara range, which they can then click on and buy. In the catering sector, Starbucks opened the world’s largest Starbucks Reserve Roastery, in Shanghai, in December 2017. It is dubbed the company’s “first fully immersive coffee wonderland in China”. Customers can use the Starbucks AR-enabled app to point at different features around the Roastery to read the Starbucks bean-to-cup story rendered in fun visuals and animations.

Other practical uses of immersive technologies include behind-the-scene applications to enhance business efficiency such as applying AR to warehousing and inventory taking. For instance, automobile companies use AR to inspect their car designs, while Boeing and Caterpillar use AR in their repair processes.

As we witness the wider adoption of immersive technologies across the retail sector, it is entirely possible that VR and AR implementations will go mainstream in the coming year. .



6

Growing adoption of robotics

In retail's never-ending quest to attract and retain customers, robots – particularly customer service chatbots

– are becoming the first customer touch point for many physical retail outlets. To help increase customer engagement, they are often deployed as “personal greeters”. According to U.S.-based market intelligence firm Tractica, the size of the global customer service robots market is projected to increase from the estimated US\$53.8 million in 2016 to US\$88 million by the end of 2022⁶.

Pepper, a humanoid robot developed by Japanese conglomerate Softbank and rolled out in Japan and some other countries, is already reshaping the shopping experience. For instance, Q Square Shopping Mall in Taipei Pepper interacts with customers by giving directions and information, as well as greetings, and by informing shoppers about promotions and events in the mall. To brighten up the in-store experience, Pepper also plays music, dances, illuminates itself and takes selfies with customers. As early as 2016, KFC China launched a voice-controlled robot in one of its Shanghai stores to take orders and suggest dishes based on customers' previous orders.

Besides customer engagement, robotics is also being used to automate business processes and increase efficiency. Flippy, a burger flipping robot, is a case in point. Unlike humanoid robots, Flippy is a robotic arm with multiple sensors and cameras that allow it to capture data. After its debut in March 2018 at a burger restaurant in California, Flippy secured a contract with Levy Restaurants, which caters the Dodger Stadium in Los Angeles, to help prepare food for the fans.

Looking to 2019 and beyond, the impact of robotics is set to be multi-dimensional, with the integration of other digital elements such as AI, cloud, IoT and analytics. As technologies mature and companies gain a better understanding of how to integrate new forms of automation into their businesses, we expect the uptake of robotics to accelerate. Enterprises will provide more engaging and interesting customer experiences, thereby boosting customer loyalty – and at reduced cost. That said, the rise of robotics and automation also sparks concerns that some jobs – particularly labor intensive, repetitive and routine jobs – will disappear as robots or automated systems perform the same tasks more cheaply.

7

Voice commerce to grow

The advent of voice assistants is changing the way people research products, compare prices and make purchases. Now, consumers can simply “talk” to smart home assistants and ask them to search products online, add them to shopping lists or even complete the buying process.

Apple’s Siri was the first digital voice assistant to be incorporated in a smartphone (iPhone 4s), in October 2011. The technology was later applied in smart speaker HomePod, which was launched in February 2018. Google Now (which became Google Assistant) on the Android platform followed, and was deployed in smart speakers such as Alexa Echo and Google Home. These have become the most popular voice assistants in Western markets.

Competition in the voice assistant market has also been heating up in China. In recent years, leading Internet companies such as Baidu, Alibaba, JD.com and Tencent entered the fray with the AI-powered smart home robot Xiaoyu Zaija; voice assistant speaker Tmall Genie; smart speaker Ding Dong, and smart voice assistant Xiaowei. These Internet giants use smart speakers to collect data on users’ preferences and speech patterns, but more importantly, to ensure users stay within their ecosystem of services. This is especially useful for e-commerce platforms such as Alibaba and JD.com. Chinese mobile and technology company Xiaomi also joined the race with the launch in July 2017 of its Xiaomi Mi Smart Network Speaker. The rising popularity of voice assistants is also driving a shift towards conversational-based voice commerce development. According to international consulting firm OC&C Strategy Consultants, the value of voice commerce is predicted to grow to over US\$40 billion in 2022, up from US\$2 billion in 2017, across the U.S. and the U.K.⁷. Most users turn to voice commerce specifically when it comes to purchasing groceries, entertainment products and services, electronics products, and clothing.

Brands and retailers are quickly adapting to the voice-shopping trend. For instance, in the U.S., Walmart offers

voice-based shopping through Google Express, selling flowers, hardware, groceries, and other goods. In France, Google Home devices can be used to shop at Carrefour. In South Korea, Lotte.com, the online store of retail conglomerate Lotte has launched a voice-activated search-and-buy service through its mobile app.

Voice commerce has yet to reach mass adoption levels by consumers and the technology itself may still be at a nascent stage. However, as consumers become more accustomed to voice interactions and continual innovations in technologies, especially in the areas of AI, AR/ VR and 5G technology, we expect voice rapidly to be a viable channel for retailers.

8

Digital payment to reach hype in 2019

With the proliferation of smartphones and wearables that have integrated payment tools, and with the availability

of high-speed mobile networks, digital payment is becoming more important in the retail sector. According to the *Information Economy Report 2017: Digitalization, Trade and Development* by the United Nations, mobile and digital currency payment systems are predicted by 2019 to overtake credit and debit cards as the most popular ways, worldwide, to pay for e-commerce purchases.

To meet consumer demand for seamless, frictionless payment, various parties – including e-commerce platforms, online payment companies and retailers – have launched their own mobile payment services. Well-known examples include Apple Pay, Google Pay, Alipay, WeChat Pay, Paytm Wallet, Walmart Pay and Venmo by PayPal. According to Juniper Research, PayPal is considered to have “the greatest opportunities to develop a converged wallet on a worldwide basis” in the next five years, followed by China’s Alipay and WeChat Pay⁸.

Transparency Market Research in the U.S. anticipates that the global mobile payment market will reach US\$50.5 billion by 2026, expanding at a CAGR of 37.8% from 2018 to 2026⁹. The Asia-Pacific region held a prominent share of the mobile payment technologies market in 2017 due to penetration by smart devices such as smartphones. China,

recognized as being the most advanced market for mobile payment in the world, has seen an exponential increase in the number of transactions made through non-banking mobile apps, up from 3.8 billion in 2013 to more than 97 billion in 2016, according to data from the Payment and Clearing Association of China. A study by Tencent's Penguin Intelligence shows that 92% of people in China's major cities use WeChat Pay or Alipay as their primary payment method. To capitalize on the rapid development and exponential growth of the global digital payment market, both WeChat Pay and Alipay have ramped up global expansion efforts. WeChat Pay, now accepted in 25 countries, is seeking to offer mobile payment services in even more countries to serve Chinese travelers. Alipay now supports payments in 27 currencies across 30 countries and is expanding its global business by forming strategic partnerships with leading payment companies in countries such as India (Paytm), the Philippines (Mynt) and South Korea (Kakao Pay).

Digital payment is set to reach new heights in 2019 as consumer demand for cashless transactions increases worldwide and as more retailers offer digital payment options. Technological advancements such as the IoT and the use of blockchain for digital payments will make mobile and online payments more secure, easier to track and less expensive.

9 Technologies empower smart logistics



In this rapidly-evolving retail environment, the ability to provide fast and efficient logistics services is a key differentiator for retailers and e-commerce operators. Logistics companies are adopting advanced technologies such as RFID, Global Positioning System (GPS), the IoT, cloud computing, drones, and robots to enhance fulfillment capability and efficiency, streamline operations and speed up delivery. This has led to a proliferation of automated warehouses and other innovations to speed up last-mile delivery.

According to DHL Express, robotics will be the norm in the logistics industry by 2022¹⁰. Retailers and e-commerce companies are stepping up efforts to build warehouses that are highly automated to improve productivity and reduce labor costs. Amazon reportedly has more than 100,000 robots inside its warehouses worldwide. The robots are used to carry stock around the warehouse floors and group together individual items needed for a specific order. Alibaba also uses smart robots inside its warehouses to move goods around and send them to human workers, who then arrange the products to be packed and posted to customers around the world. The robots reportedly handle 70% of the work in Alibaba's warehouses.

Meanwhile, rapid advances in technology are revolutionizing last-mile delivery. Amazon and Walmart are experimenting with unmanned aerial vehicles (UAVs) and deliveries by Uber-style networks of crowd-sourced locals. Amazon is also trialing drone delivery via Prime Air in the U.K. In China, JD.com and Cainiao, the logistics arm of Alibaba, are also using drones to deliver packages in rural areas. Recently, Alibaba announced a last-mile delivery robot called the G Plus. The robot is used to deliver parcels, groceries and food on campus environments and within residential neighborhoods. The robots' entire journey can be monitored on a smartphone.

Recently, some retailers have introduced pick-up towers to facilitate last-mile delivery and smart logistics development. For instance, Walmart and Asda have pick-up/parcel towers in some stores in the U.S. and the U.K., respectively. Customers can collect their online purchases from self-service collection kiosks.

Looking ahead, as technologies continue to advance, they are set to make retail logistics faster, smarter and more efficient. To stay competitive, forward-thinking retailers and e-commerce companies will continue to harness technologies to streamline the logistics process and increase the speed of delivery.

10

Blockchain improves supply chain transparency

Blockchain technology is touted as the next game changer for all aspects of business as it creates a permanent, transparent and searchable link to trace and track the journey of products. This digital, decentralized, distributed ledger provides a way for information to be recorded, shared and maintained by a community. The technology can track, trace, and authenticate products, record contracts and transactions and guarantee the movement of information, while ensuring all information is exchanged with a high level of security, and that a transaction cannot be reversed once it is recorded in the database.

According to Reportlinker, a professional search engine based in France, the blockchain retail market size is predicted to grow from US\$80 million in 2018 to US\$2.34 billion in 2023, at a CAGR of 96.4% during the forecast period. The Asia-Pacific region is expected to experience the highest growth during the period, and North America to hold the largest market size¹¹.

Increasing numbers of retailers, especially those in the luxury and fresh produce sectors, use blockchain to improve transparency in the supply chain and safeguard product quality. Blockchain is increasingly used in the luxury sector to ensure product authenticity and boost consumer security. An example is the diamond industry.

Blockchain replaces the paper certification process for ensuring the provenance of any diamond to minimize the risk of fraud and counterfeiting. Beyond that, with its tamper-proof ledger, all transactions made in relation to a product will be recorded in the blockchain. This allows customers to track every piece of information related to the product as it moves along the supply chain. Richemont, the parent company of Cartier, is piloting a blockchain tracing project with blockchain start-up Arianee to enable customers to authenticate potential purchases¹².

In the fresh produce sector, where speed to market and traceability are crucial, retailers are eager to set up food-tracking system using blockchain technology. For instance, Alibaba's supermarket chain Hema Xiansheng and leading Chinese supermarket operator YH Superstores have launched food-tracking systems that use the technology to trace the place of origin of the products. Globally, 12 of the world's biggest companies including Walmart and Nestlé have partnered with IBM to establish an "IBM Food Trust" platform with the main mission to improve traceability. The companies are building a blockchain to remake how the industry tracks food worldwide.

As brands and retailers look to stay ahead of the competition, the need for a digital platform that ensures trust, security, and visibility has never been greater. While blockchain is still an emerging technology and yet to become commonplace, it is set to make a profound impact on retail and related businesses, particularly in addressing the current pain points of supply chain, such as traceability, compliance and authenticity.



BLOCKCHAIN

In sum: harness technologies to embrace change

Technology is revolutionizing retail. Today's digitally-empowered customers have enormous say over what products retailers stock, how quickly lines are replenished or replaced, and over how and where products are made. Moreover, faced with the higher expectations of their customers, retailers and brands are turning shopping into a personalized and exciting multichannel experience.

Many enterprises are already in the throes of a digital transformation. To ensure their transformation stays on the right track and is sustainable, brands and retailers need to know both the direction and the benefits of latest trends in retail technology. They also need to come up with the right digital-driven strategies supported by the right level of investment, the right teams on the ground and constant customer engagement.

Those retailers and brands who do manage to harness the power of technology to embrace digital transformation are more likely to compete successfully in the digital world.

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